DINOSAURS!

•DISCOVER THE GIANTS OF THE PREHI D•

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DINOSAURS!

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**DINOSAURS! is published by
Orbis Publishing Ltd
Griffin House
161 Hammersmith Rd
London W6 8SD**
© 1994 Orbis Publishing

**EDITORIAL & DESIGN by
Tucker Slingsby
3G London House
66-68 Upper Richmond Rd
London SW15 2RP**

**N87 94 12 01
ISBN 0 7489 1687 3**

**Printed in Italy by Officine Grafiche
De Agostini, Novara**

DSUNGARIPTERUS

Giant *Dsungaripterus* dug crabs and shellfish out of the rocks with its mighty, curved jaws.

Dsungaripterus was one of the larger pterosaurs, with a wingspan of 3m. It was also one of the most successful pterosaurs. *Dsungaripterus* lived on Earth for more than 50 million years.

RULING THE SKIES

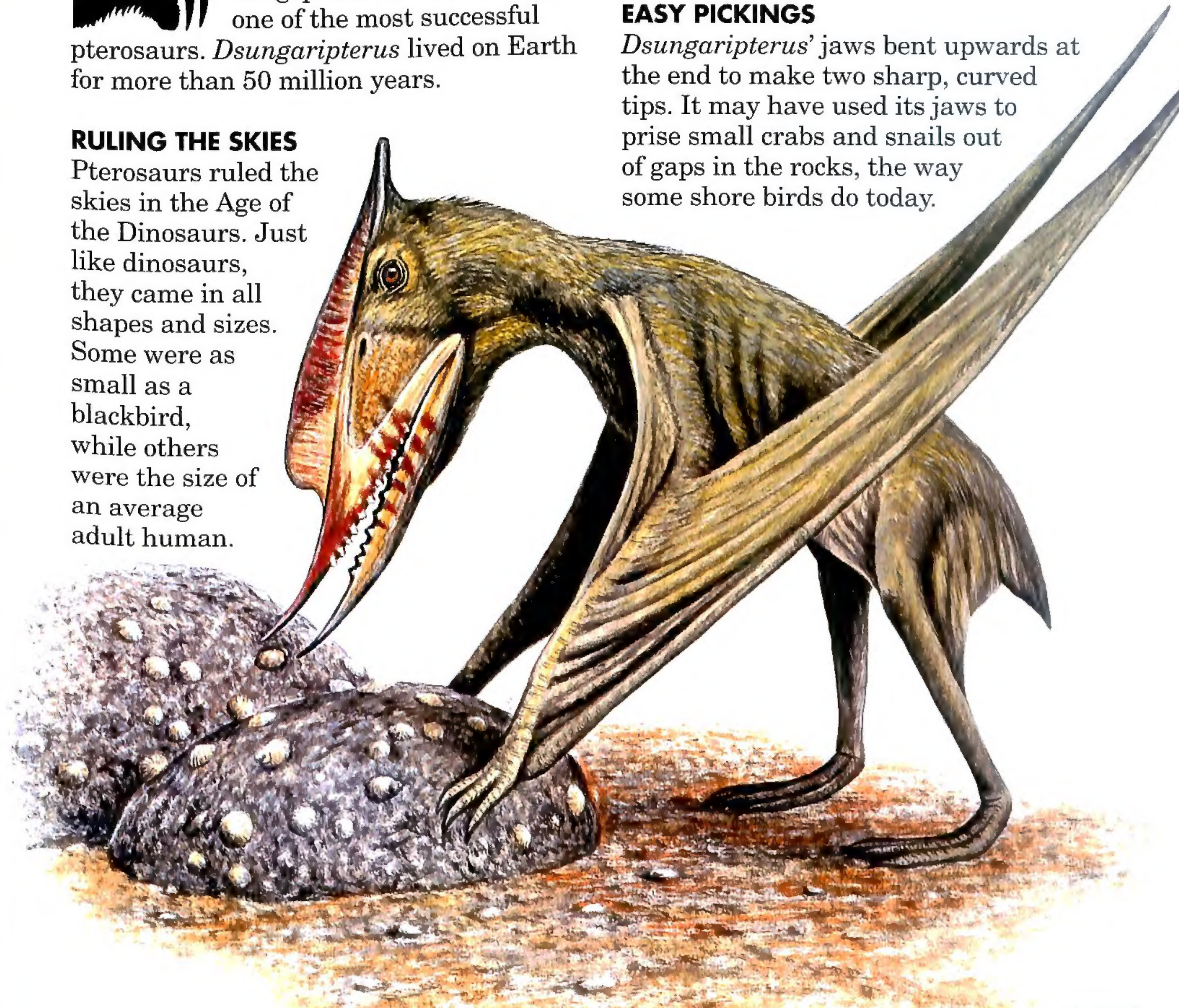
Pterosaurs ruled the skies in the Age of the Dinosaurs. Just like dinosaurs, they came in all shapes and sizes. Some were as small as a blackbird, while others were the size of an average adult human.

SPECIAL BEAKS

Most pterosaurs lived near water, and snapped up fish or sieved up plankton (a mixture of tiny sea creatures and plants). Many evolved special beaks to help them feed on the particular type of food that was available where they lived.

EASY PICKINGS

Dsungaripterus' jaws bent upwards at the end to make two sharp, curved tips. It may have used its jaws to prise small crabs and snails out of gaps in the rocks, the way some shore birds do today.



MONSTER FACTS

- **NAME:** *Dsungaripterus* (zun-ga-rip-tare-us) means 'Junggar-wing', after the Junggar basin in China
- **GROUP:** pterosaur
- **SIZE:** 3m wingspan
- **FOOD:** fish and shellfish
- **LIVED:** about 150 million years ago in the Late Jurassic to Early Cretaceous Periods in China

CHINESE DRAGON

Scientists first discovered *Dsungaripterus* in the 1960s. It was the first pterosaur to be found in China. A beautifully preserved section of skeleton and parts of a skull were dug out of the bare, arid earth of the Junggar basin in north-western China. More fossils of the giant pterosaur were excavated in the same area 10 years later.

IT'S A FACT

LOOK ALIKE

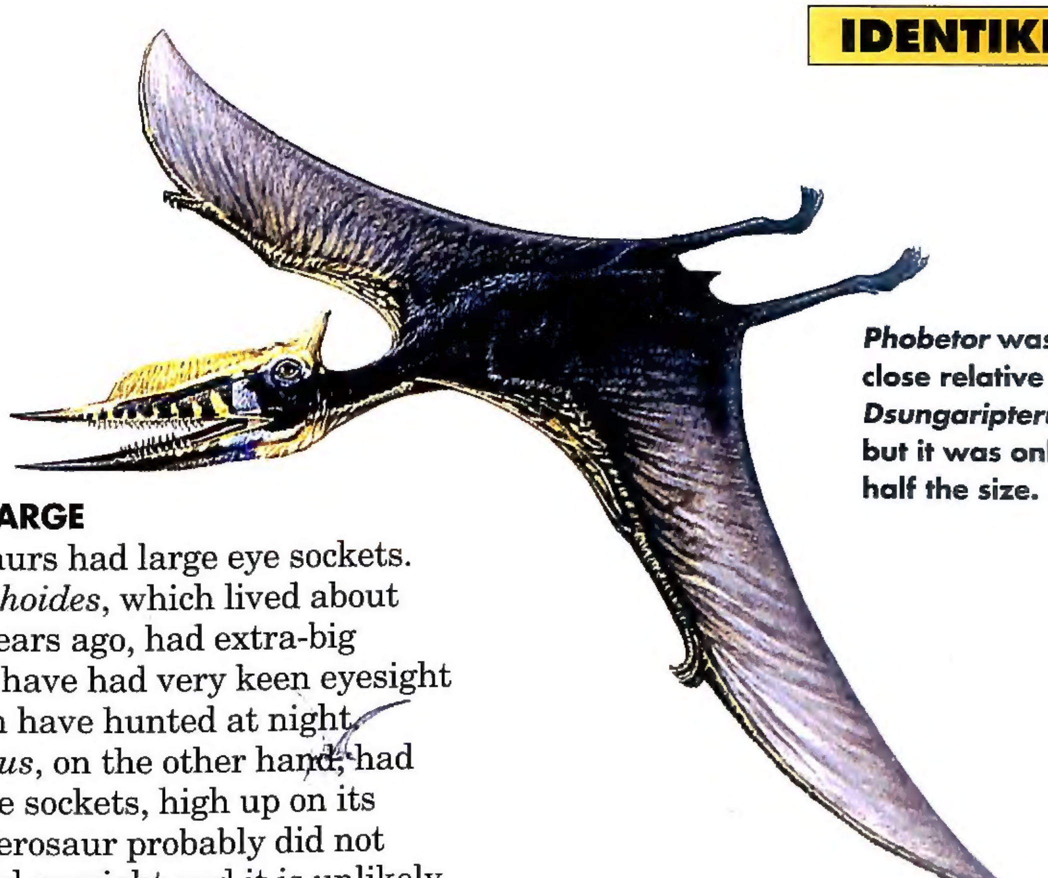
Scientists believed they had discovered another *Dsungaripterus* in Mongolia in 1982. But this find turned out to be a new kind of pterosaur. It looked like *Dsungaripterus*, but it was only half as big. The new discovery was named *Phobetor*, which means 'frightening one'.

FAR AND WIDE

Experts believe that *Dsungaripterus* appeared in the Late Jurassic Period, more than 150 million years ago. At that time, the two land masses called Gondwana, in the south, and Laurasia, in the north, had started moving apart to form the continents we know today. The pterosaur probably lived in the south, in the region that became Africa. It was a good hunter and survived into the Cretaceous Period. By that time, *Dsungaripterus* had spread east to Asia.

BIGHEAD

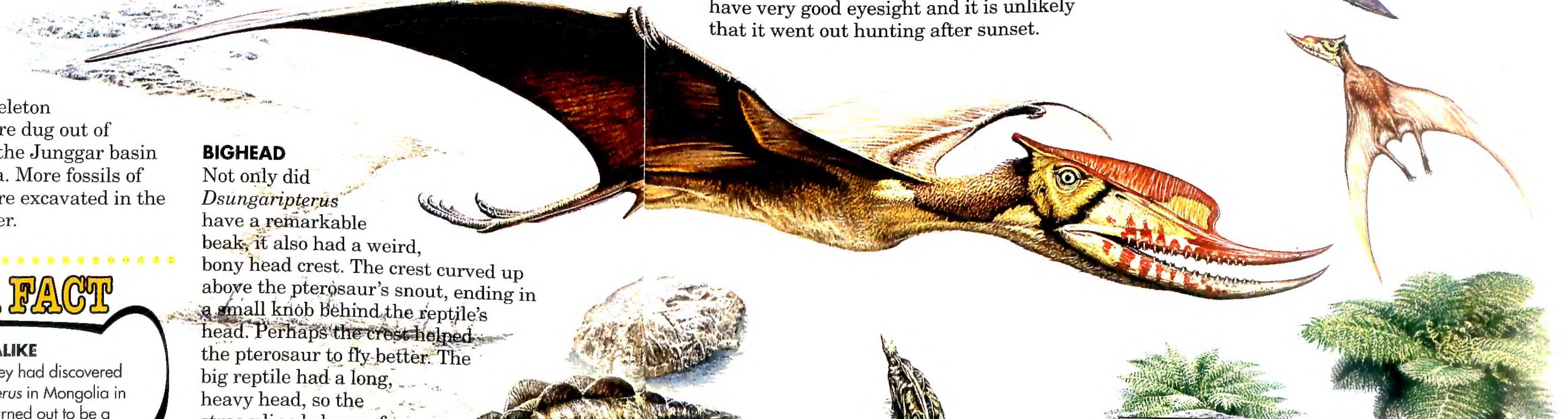
Not only did *Dsungaripterus* have a remarkable beak, it also had a weird, bony head crest. The crest curved up above the pterosaur's snout, ending in a small knob behind the reptile's head. Perhaps the crest helped the pterosaur to fly better. The big reptile had a long, heavy head, so the streamlined shape of the crest could have made it fly more quickly with less effort. It may also have increased the distance it could glide.

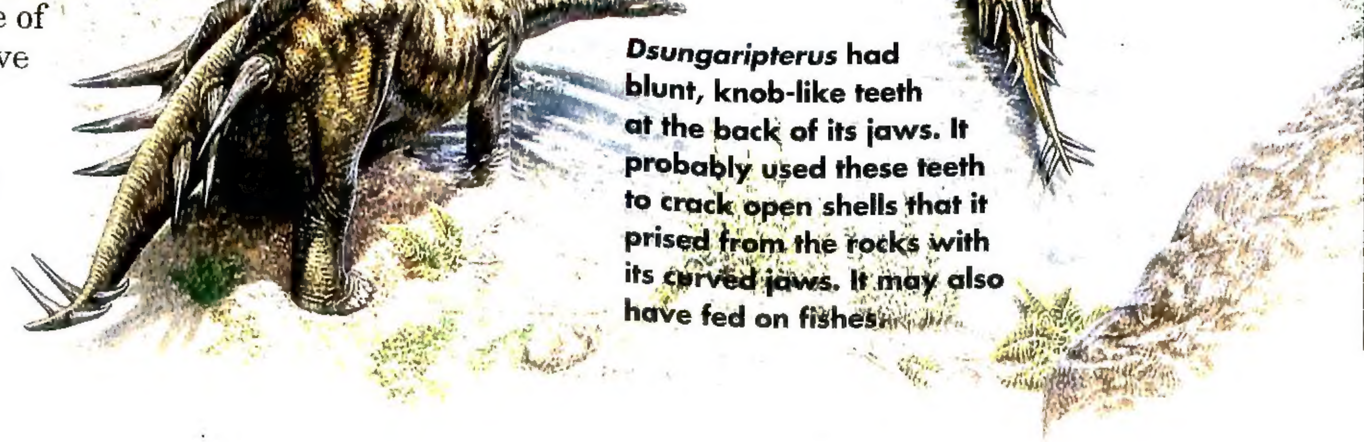


***Phobetor* was a close relative of *Dsungaripterus*, but it was only half the size.**

LITTLE AND LARGE

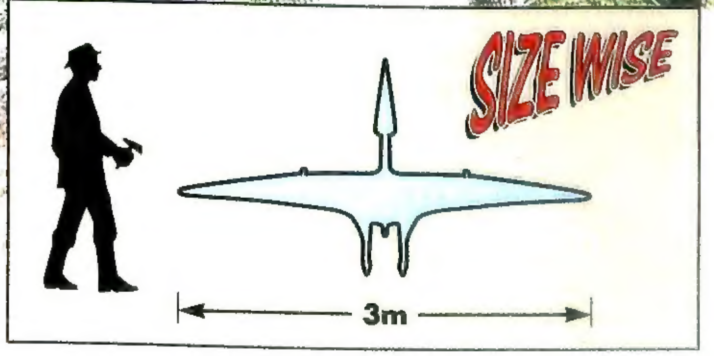
Many pterosaurs had large eye sockets. *Campylognathoides*, which lived about 190 million years ago, had extra-big eyes. It must have had very keen eyesight and may even have hunted at night. *Dsungaripterus*, on the other hand, had very small eye sockets, high up on its head. This pterosaur probably did not have very good eyesight and it is unlikely that it went out hunting after sunset.





***Dsungaripterus* had blunt, knob-like teeth at the back of its jaws. It probably used these teeth to crack open shells that it prised from the rocks with its curved jaws. It may also have fed on fishes.**

SIZE WISE



DENVERSAURUS

Fearsome shoulder spikes helped to protect the dinosaur *Denversaurus* from hungry tyrannosaurs.

Denversaurus was a peaceful plant-eater, but it looked terrifying, and was protected by thick, bony plates of armour and spikes.

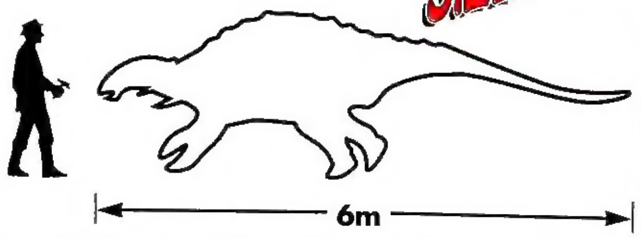
MISTAKEN IDENTITY

Denversaurus belonged to a family of ankylosaurs called the nodosaurids (no-do-saw-rids). Scientists believed that *Edmontonia* was the last of the line. But in 1988 *Denversaurus*, which had been discovered in 1924 in South Dakota, USA, was re-identified as a new nodosaurid. It lived millions of years after *Edmontonia*.

SHOWDOWN

Denversaurus looked rather like a giant killer armadillo. If attacked, it probably turned to face its enemy rather than backing away. It may have used its long tail to balance itself as it swung round to keep its deadly spikes aimed at its attacker.

SIZE WISE

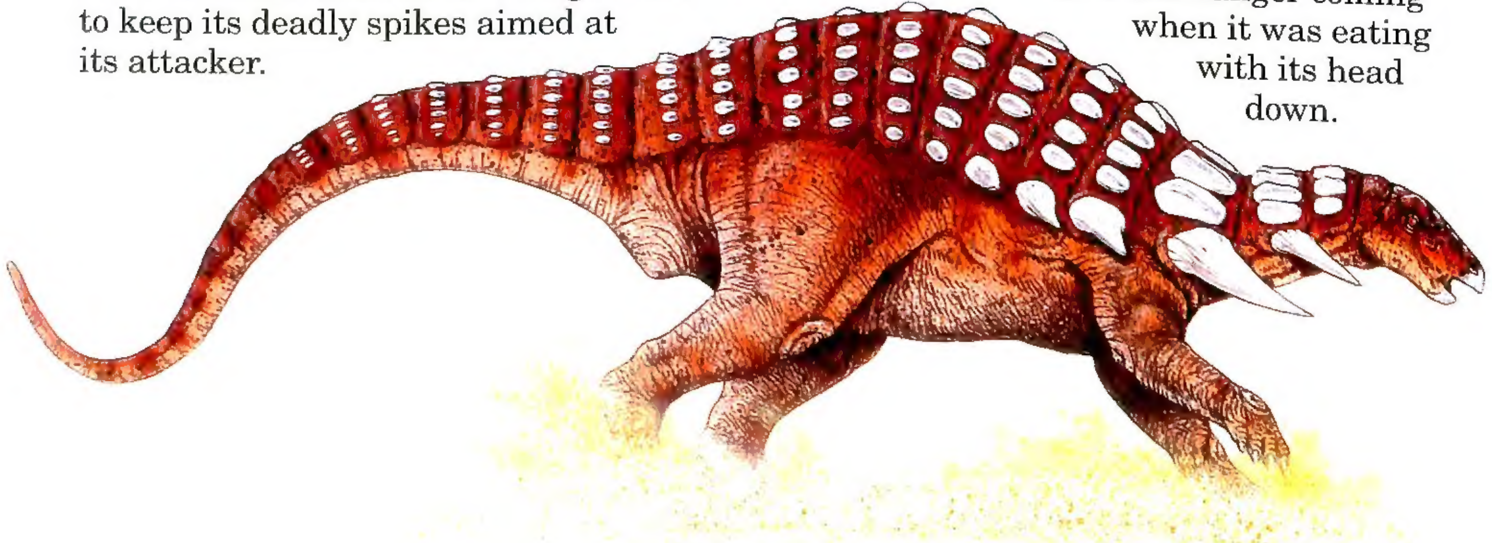


MONSTER FACTS

- **NAME:** *Denversaurus* (den-ver-sore-us) means 'Denver lizard'
- **GROUP:** dinosaur
- **SIZE:** 6m long
- **FOOD:** plants
- **LIVED:** about 70 million years ago in the Late Cretaceous Period in North America

LOOK OUT

Most nodosaurids had their eyes in the middle of the skull, but *Denversaurus*' were at the back of its skull. This allowed it to see danger coming when it was eating with its head down.



CORYPHODON

Heavy, hippo-like *Coryphodon* rooted around for food in the prehistoric swamps and marshes.

A group of slow-moving plant-eaters called pantodonts flourished 40 to 60 million years ago. They had short legs, broad feet and long canine teeth. Some were rat-sized, while others, such as *Coryphodon*, were as big as a hippo.

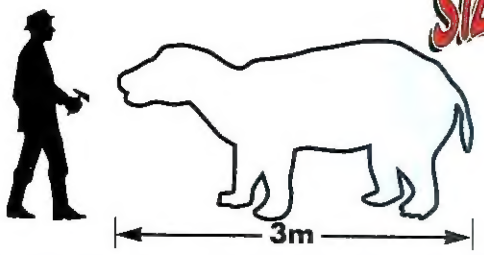
SWAMPED

At over 3m long, *Coryphodon* was the largest of the pantodonts. The bulky plant-eater had a large head and broad snout. Like a hippo, it probably wallowed in shallow water. It had knife-like tusks which it may have used to uproot bulbs and roots.

TOO BIG TO HANDLE

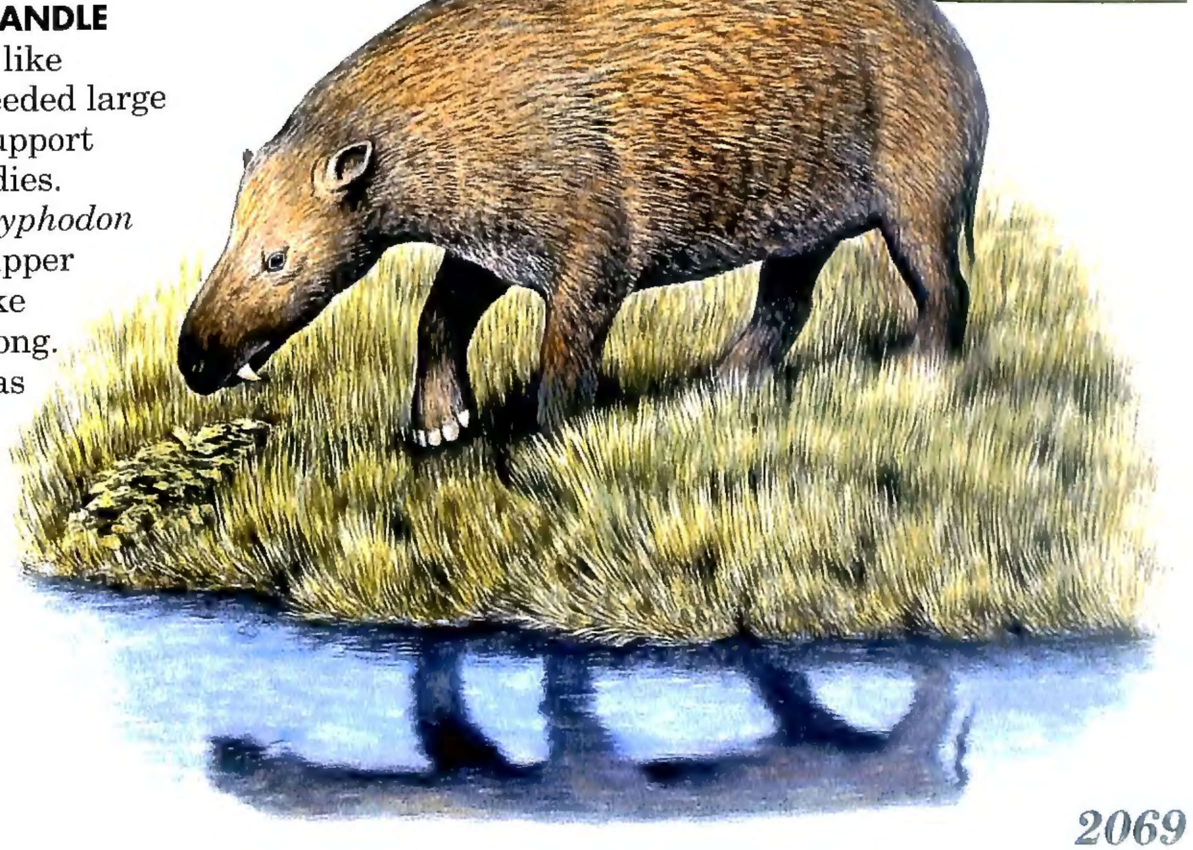
Big herbivores like *Coryphodon* needed large foot bones to support their heavy bodies. The legs of *Coryphodon* also had long upper sections to make them extra-strong. *Coryphodon* was too large to escape attack by running away, but its size and sabre-like teeth may have put off attackers.

SIZE WISE



MONSTER FACTS

- **NAME:** *Coryphodon* (korry-foh-don) means 'curved tusks'
- **GROUP:** mammal
- **SIZE:** over 3m long
- **FOOD:** plants
- **LIVED:** 60 million years ago in North America, Europe and Asia



Atlas of finds

NORTH AMERICA

So far, there have been more dinosaur finds in Canada and the USA than anywhere else on Earth.

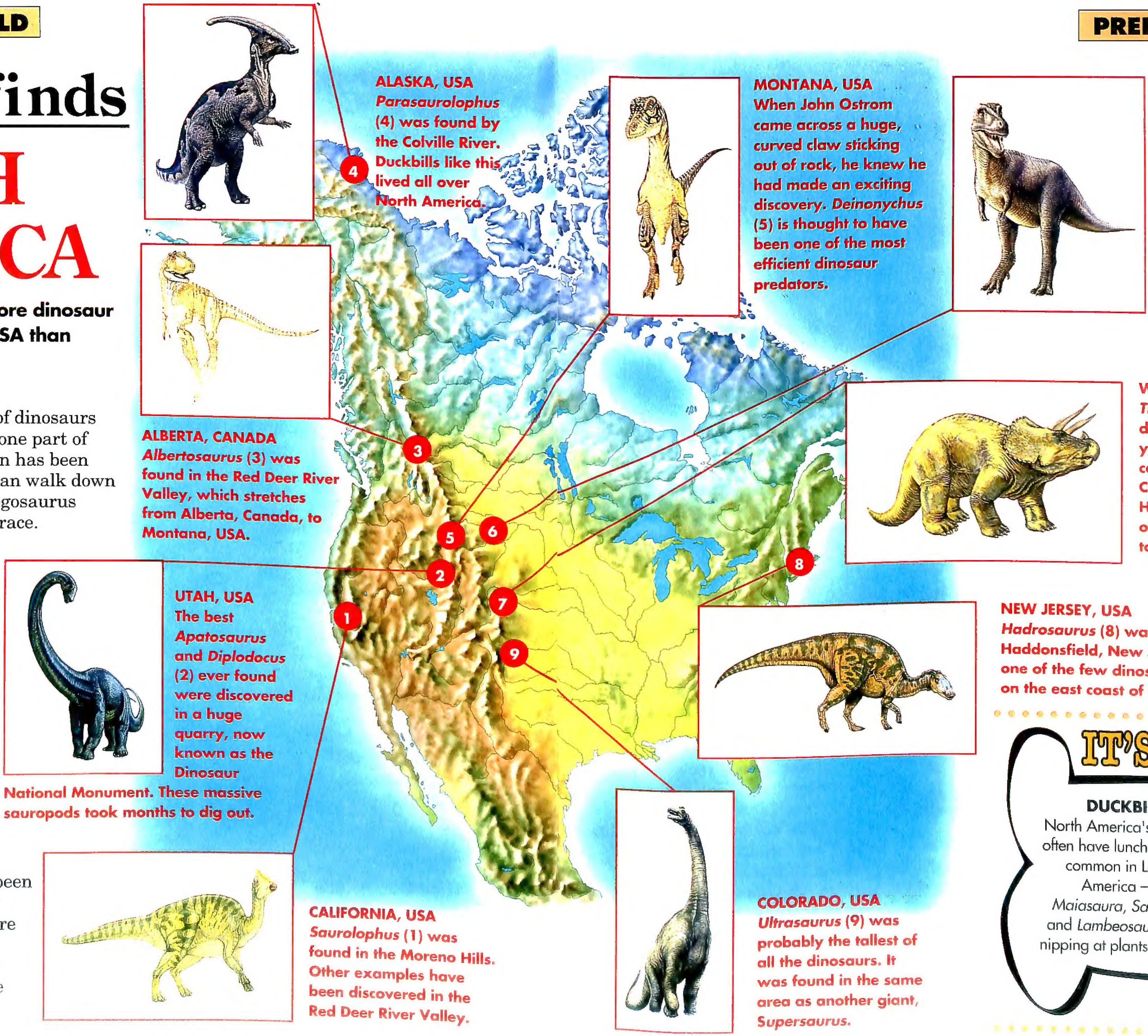
Such huge numbers of dinosaurs have been found in one part of Colorado that a town has been named Dinosaur. Here, you can walk down Brontosaurus Boulevard, Stegosaurus Freeway and Triceratops Terrace.

PUBLIC PARK

From the frozen north of Canada and Alaska to the deserts of south-western USA, hundreds of dinosaurs have been found. In some places, such as Utah, USA, and Alberta, Canada, there are so many fossils that large areas have been made into open-air museums and national parks.

EGG-CITING DISCOVERIES

Skeletons are not the only dinosaur remains that have been found in North America. Egg Mountain in Montana is where palaeontologists found an amazing group of *Maiasaura* nests containing eggs and the fossils of baby dinosaurs.



ALASKA, USA
***Parasaurolophus* (4) was found by the Colville River. Duckbills like this lived all over North America.**

MONTANA, USA
When John Ostrom came across a huge, curved claw sticking out of rock, he knew he had made an exciting discovery. *Deinonychus* (5) is thought to have been one of the most efficient dinosaur predators.

MONTANA, USA
The most famous of all dinosaurs, *Tyrannosaurus rex* (6), was first discovered at Hell Creek in 1902 by the great dinosaur detective Barnum Brown. *T rex* have since been found all over western North America.

ALBERTA, CANADA
***Albertosaurus* (3) was found in the Red Deer River Valley, which stretches from Alberta, Canada, to Montana, USA.**

WYOMING, USA
***Triceratops* (7) was discovered over 100 years ago in a deep canyon, called Lance Creek, by John Bell Hatcher. It was the first of the horned dinosaurs to be found.**

UTAH, USA
The best *Apatosaurus* and *Diplodocus* (2) ever found were discovered in a huge quarry, now known as the Dinosaur National Monument. These massive sauropods took months to dig out.

NEW JERSEY, USA
***Hadrosaurus* (8) was found in Haddonsfield, New Jersey. This was one of the few dinosaur discoveries on the east coast of North America.**

CALIFORNIA, USA
***Saurolophus* (1) was found in the Moreno Hills. Other examples have been discovered in the Red Deer River Valley.**

COLORADO, USA
***Ultrasaurus* (9) was probably the tallest of all the dinosaurs. It was found in the same area as another giant, *Supersaurus*.**

IT'S A FACT

DUCKBILLS FOR LUNCH

North America's ferocious predators must often have lunched on duckbills. They were common in Late Cretaceous North America – *Parasaurolophus*, *Maiasaura*, *Saurolophus*, *Kritosaurus* and *Lambeosaurus* all lived peacefully, nipping at plants with their duck-like bills.

DINOSAUR TREASURE TROVE

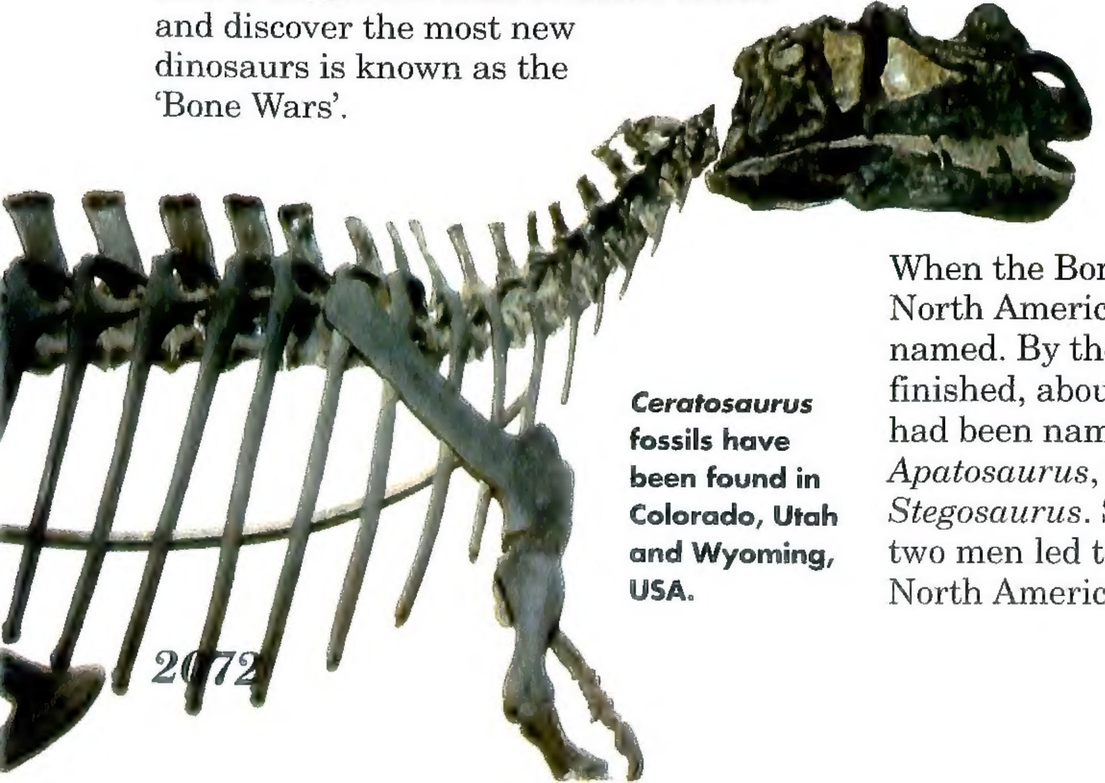
During the Mesozoic Era, from the Triassic to the Cretaceous, the area we now call North America must have been a dinosaur paradise. The first named North American dinosaur was *Hadrosaurus*, which was described by Joseph Leidy in 1858. By the 1990s, North America boasted between 170 and 180 different dinosaur discoveries. Massive sauropods, huge herds of duckbills and many horned dinosaurs made this area their home, as did the ruthless predators *Allosaurus*, *T rex* and *Albertosaurus*.

BRAVE HUNTERS

The early dinosaur hunters faced dangers and difficulties. They fought off attacks by the native North Americans, braved white-water rapids to get to unexplored territory, and were nearly eaten alive by midges. But they filled American museums with rare dinosaur treasures.

BONE RIVALS

The North American dinosaur rush began in the 1870s. News of rich bone beds in Utah, Wyoming and Colorado reached the ears of two famous rivals: Othniel Charles Marsh and Edward Drinker Cope. Their race to collect the most dinosaur fossils and discover the most new dinosaurs is known as the 'Bone Wars'.



***Ceratosaurus* fossils have been found in Colorado, Utah and Wyoming, USA.**

Hadrosaurs (above) lived all over North America.

A reconstruction (above) of *Maiasaura* with a nest of young. A nest just like this was found in Montana.

USEFUL WAR

When the Bone Wars began, only nine North American dinosaurs had been named. By the time the Bone Wars finished, about 20 years later, 136 more had been named, including *Allosaurus*, *Apatosaurus*, *Camarasaurus* and *Stegosaurus*. So a bitter rivalry between two men led to an amazing increase in North American dinosaur discoveries.

A total of 11 skeletons of *T rex* (left) have been found in the USA and Canada.

CARING PARENTS

When the nest containing the skeletons of *Maiasaura* babies was found in Montana, an exciting discovery was made. The babies' teeth were worn down. This proved that an adult had brought them food in the nest. It was the first evidence that some dinosaurs cared for their young.

PALAEONTOLOGISTS' PARADISE

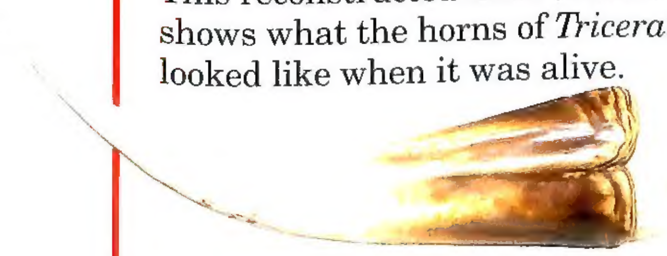
Barnum Brown used a raft to float down the Red Deer River looking for dinosaur sites. The rugged landscape, known as the Badlands, was bristling with dinosaur bones. Brown made his discoveries in the early 1900s. Today, the area is known as Dinosaur Provincial Park and about 50 kinds of dinosaur have been found there.

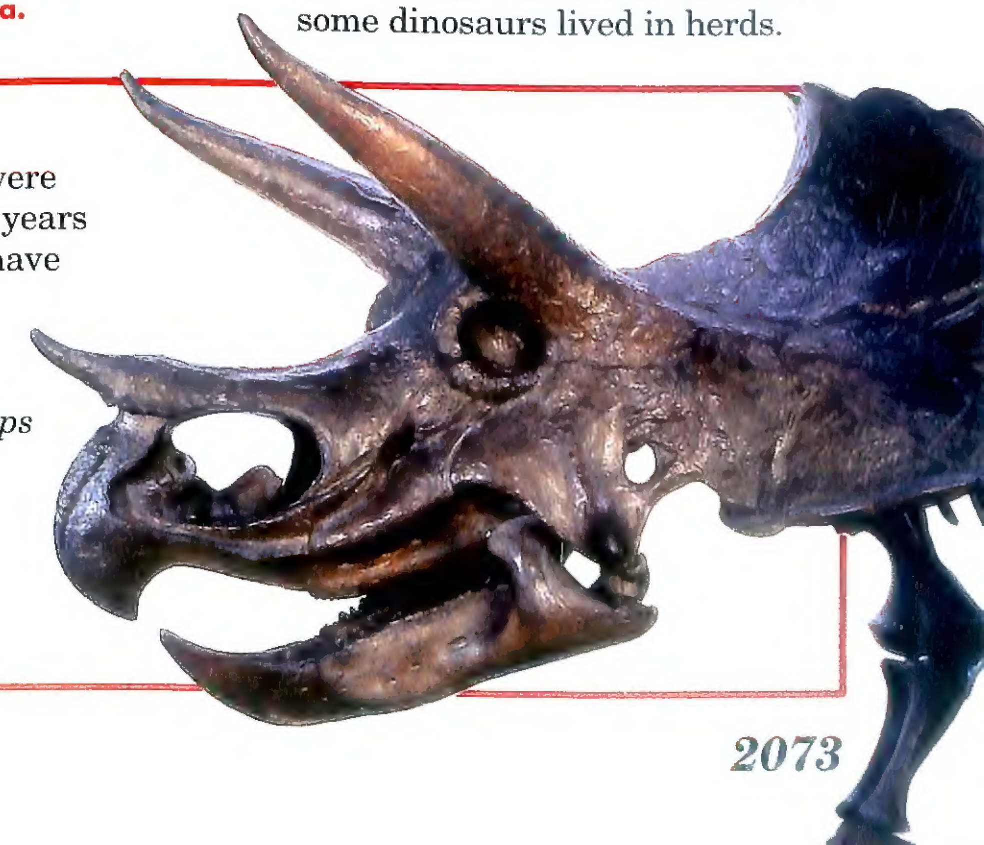
MASS GRAVES

At Ghost Ranch, New Mexico, hundreds of *Coelophysis* skeletons were found lying together. They were probably killed by a natural disaster, such as a flood. A mass grave of *Centrosaurus* was found in the Red Deer River Valley, while one of *Allosaurus* has been found in Utah. This evidence has led scientists to believe some dinosaurs lived in herds.

FIRST HORNED DINOSAUR

Since the first *Triceratops* bones were found in Wyoming more than 100 years ago, 50 *Triceratops* skulls (right) have been discovered. But no-one has yet found a complete skeleton. This reconstructed horn (below) shows what the horns of *Triceratops* looked like when it was alive.

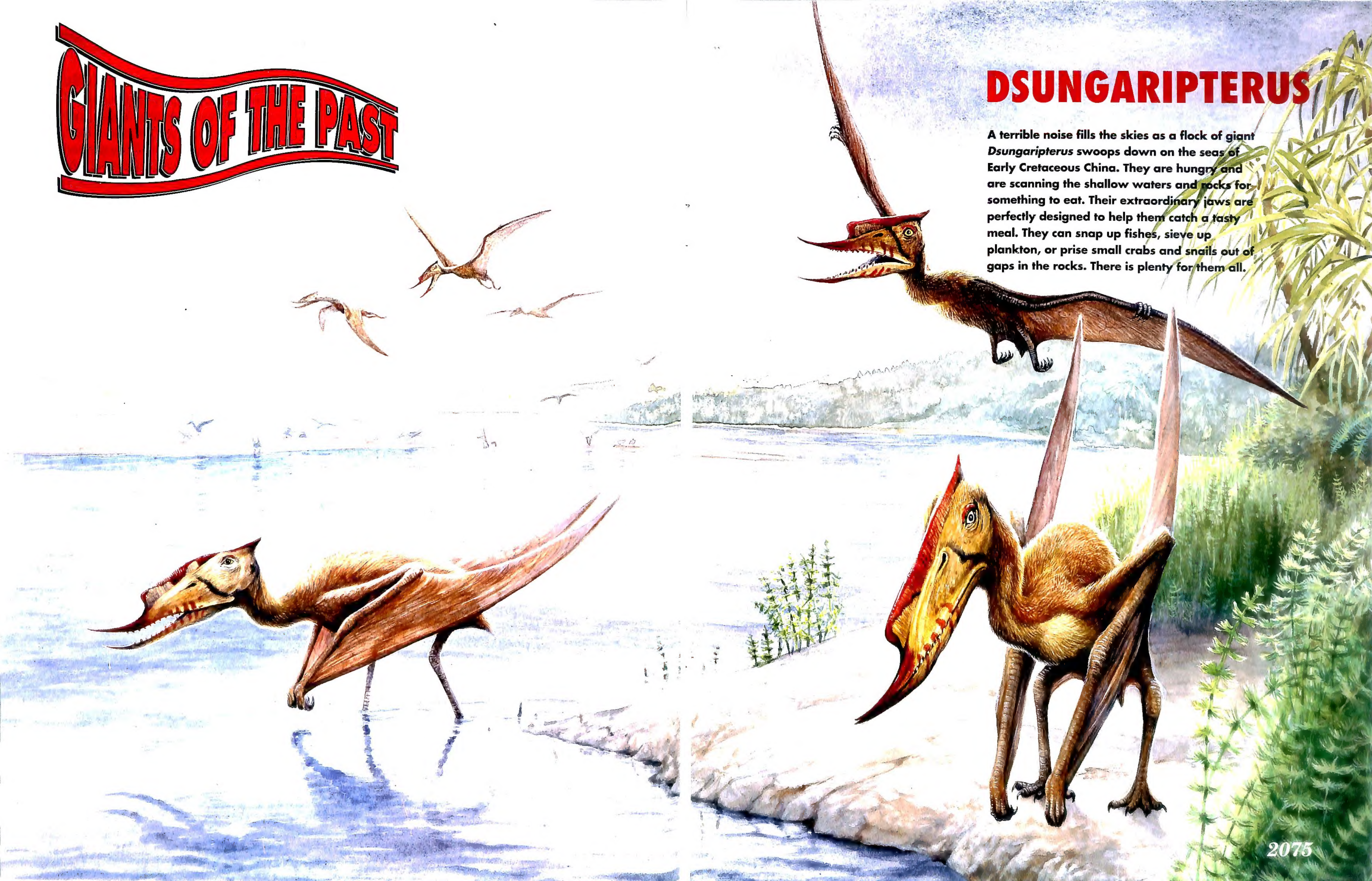




GIANTS OF THE PAST

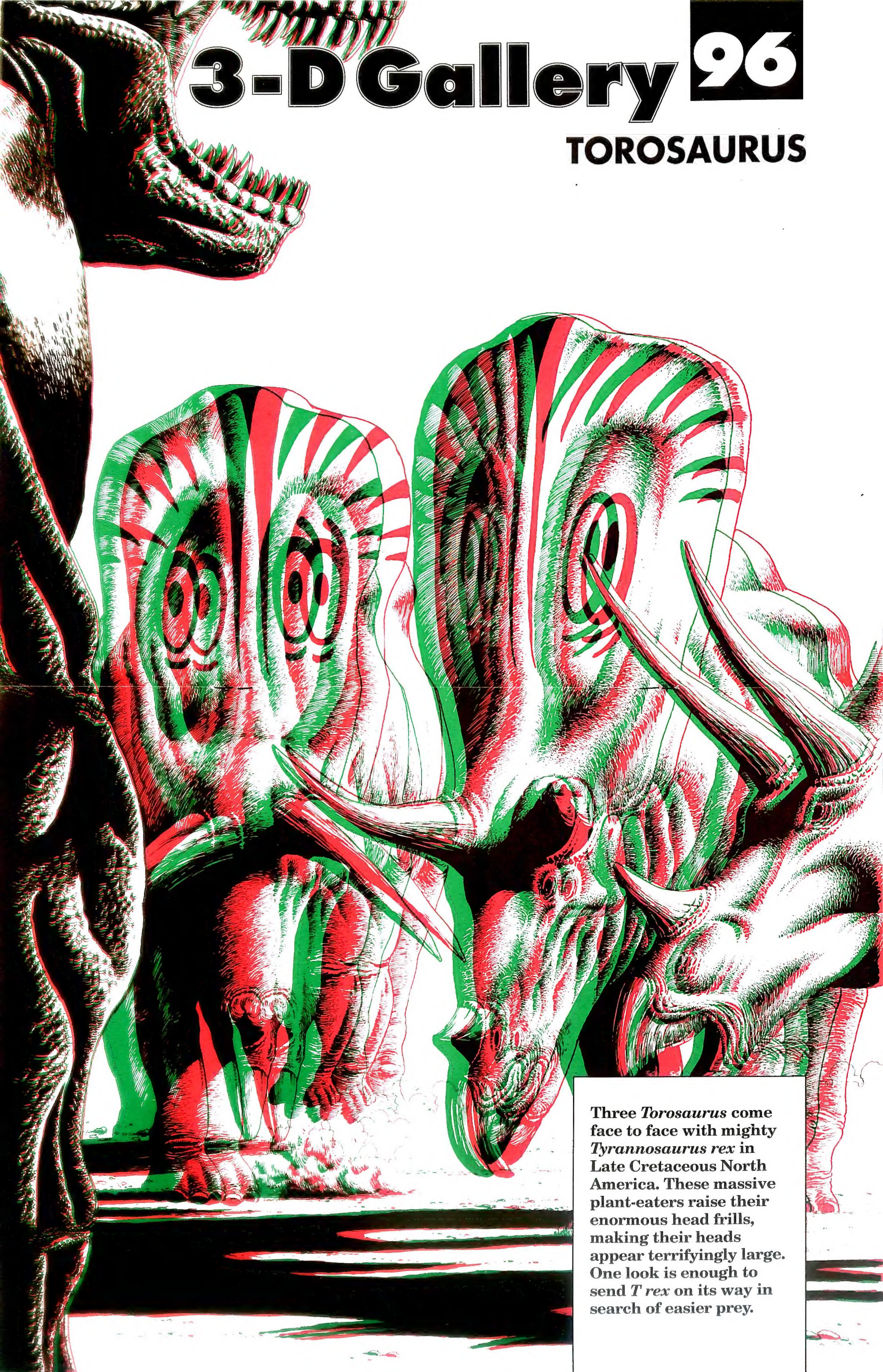
DSUNGARIPTERUS

A terrible noise fills the skies as a flock of giant *Dsungaripterus* swoops down on the seas of Early Cretaceous China. They are hungry and are scanning the shallow waters and rocks for something to eat. Their extraordinary jaws are perfectly designed to help them catch a tasty meal. They can snap up fishes, sieve up plankton, or prise small crabs and snails out of gaps in the rocks. There is plenty for them all.



3-D Gallery 96

TOROSAURUS

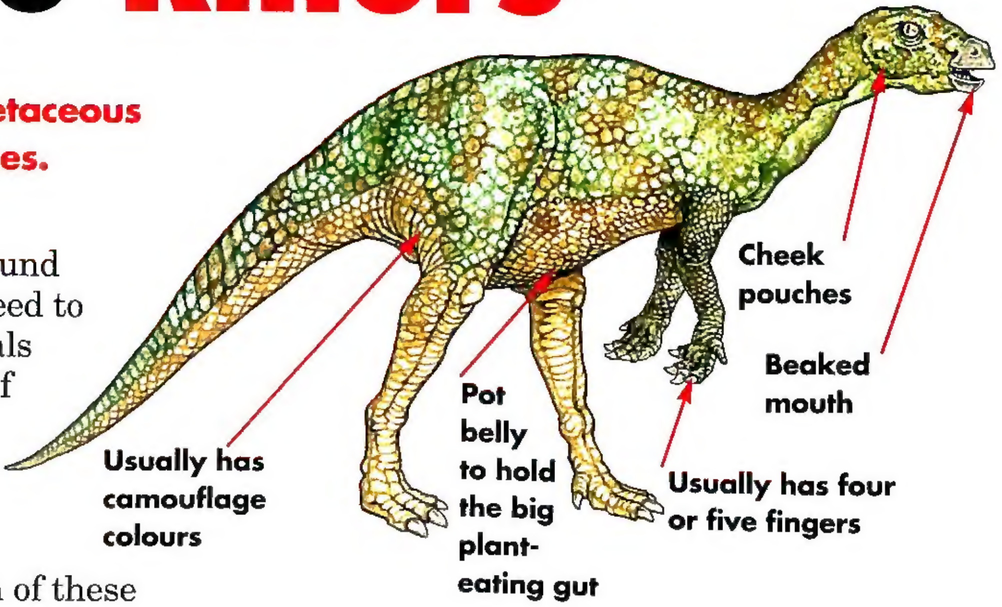


Three *Torosaurus* come face to face with mighty *Tyrannosaurus rex* in Late Cretaceous North America. These massive plant-eaters raise their enormous head frills, making their heads appear terrifyingly large. One look is enough to send *T rex* on its way in search of easier prey.

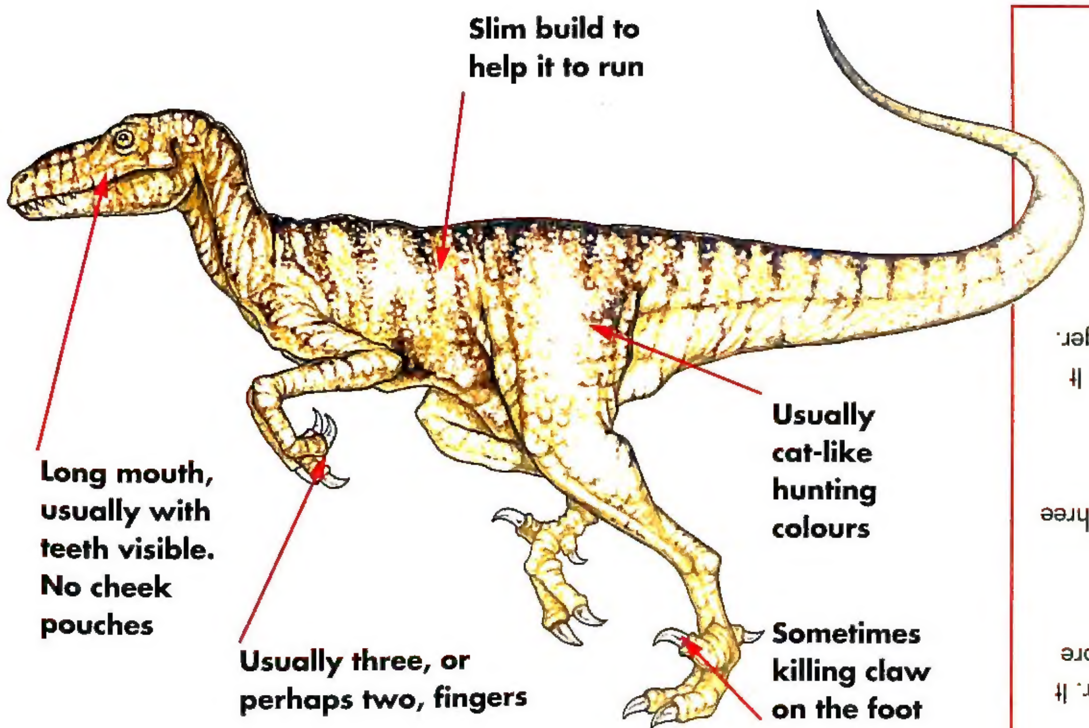
Spot the killers

The Triassic, Jurassic and Cretaceous Periods were dangerous times.

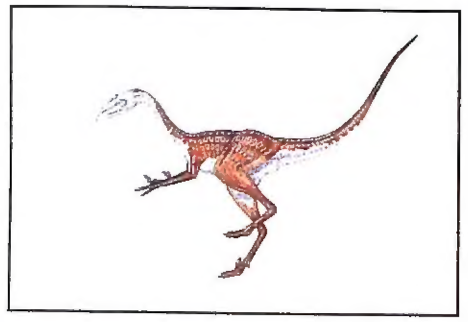
If you had been around then, you would need to know which animals were safe and which were not. If you saw a dinosaur about your size and walking on two legs, how would you know if it was a plant-eater or a meat-eater? Do you know which of these 10 dinosaurs would be safe, and which would make you sorry if they spotted you?


Usually has camouflage colours
Pot belly to hold the big plant-eating gut
Cheek pouches
Beaked mouth
Usually has four or five fingers

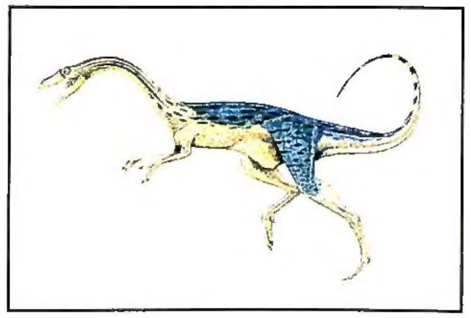
SAFE: PLANT-EATING ORNITHOPOD


Slim build to help it to run
Long mouth, usually with teeth visible. No cheek pouches
Usually three, or perhaps two, fingers
Usually cat-like hunting colours
Sometimes killing claw on the foot

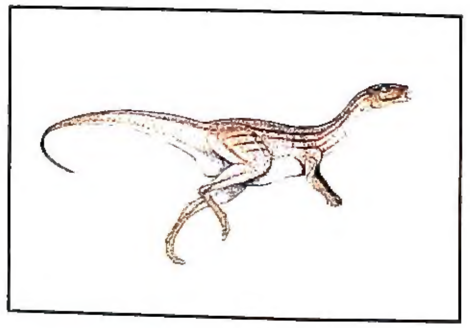
NOT SAFE: MEAT-EATING THEROPOD



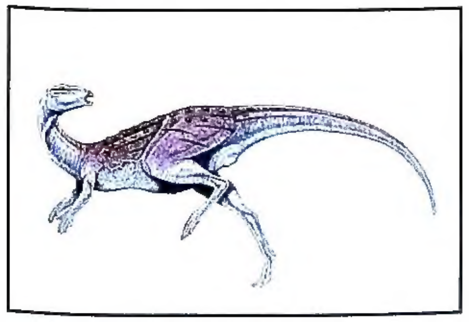
DINOSAUR 1
SIZE: up to 2m long
LIVED: Late Cretaceous
CLUE: watch out for the claw



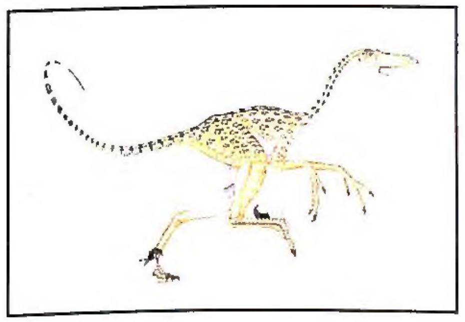
DINOSAUR 2
SIZE: about 3m long
LIVED: Late Cretaceous
CLUE: look at its lean build



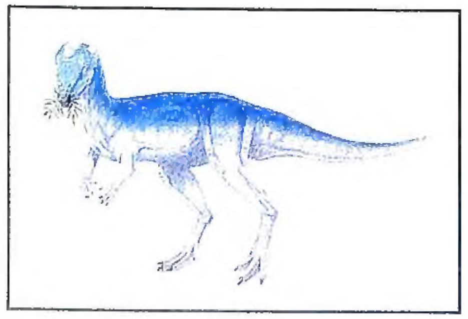
DINOSAUR 3
SIZE: up to 3m long
LIVED: Early Cretaceous
CLUE: what a fat stomach!



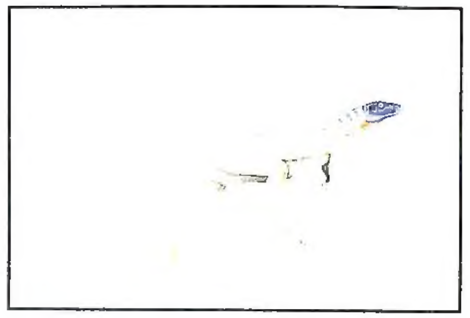
DINOSAUR 4
SIZE: 3.4m long
LIVED: Late Cretaceous
CLUE: five-fingered hands



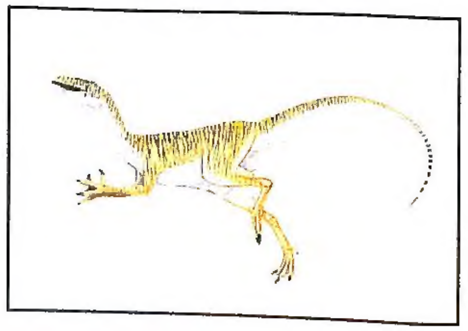
DINOSAUR 5
SIZE: 1.8m long
LIVED: Late Cretaceous
CLUE: look at the toothy jaws



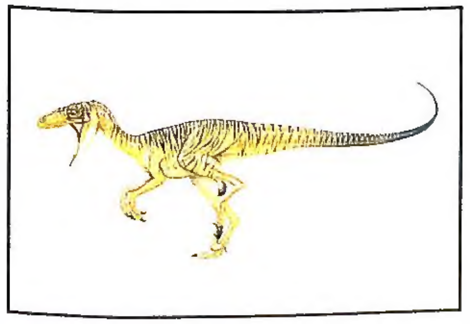
DINOSAUR 6
SIZE: 3m long
LIVED: Late Cretaceous
CLUE: count the fingers



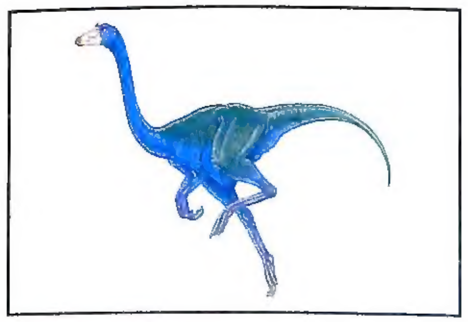
DINOSAUR 7
SIZE: 1m long
LIVED: Early Jurassic
CLUE: look at its cheeks



DINOSAUR 8
SIZE: 2m long
LIVED: Late Jurassic
CLUE: how many fingers has it?



DINOSAUR 9
SIZE: 3m long
LIVED: Early Cretaceous
CLUE: what animal has stripes?



DINOSAUR 10
SIZE: 3.5m long
LIVED: Late Cretaceous
CLUE: look it in the mouth

ANSWERS

(1) NOT SAFE
Borogovia was a meat-eater. It killed with its big hind claw.

(2) NOT SAFE
Elmisaurus was a meat-eater, slimly built for chasing prey.

(3) SAFE
Atlascopcosaurus was a plant-eater. It needed a big stomach to digest its tough plant food.

(4) SAFE
Thescelosaurus was a plant-eater. Its hands would have helped it grab plants and leaves.

(5) NOT SAFE
Velociraptor was a meat-eater. Nothing could survive those jaws and teeth tearing into it.

(6) SAFE
Stygimoloch was a plant-eater. Its hands may have been used for grabbing handfuls of leaves.

(7) SAFE
Lesothosaurus was a plant-eater. It chewed plants in its cheeks before swallowing them.

(8) NOT SAFE
Coelurus was a meat-eater. Its three fingers grasped its prey.

(9) NOT SAFE
Deinonychus was a meat-eater. It may have been striped like a tiger.

(10) EITHER/OR
Garudimimus belongs to a meat-eating dinosaur group, the theropods, but it had a beaked mouth so it probably ate leaves and plants as well as meat.

Fossils in the limestone

In southern Germany, lithographic limestone quarries, like the one below left, have revealed a remarkably detailed record of animal life from the Age of the Dinosaurs.

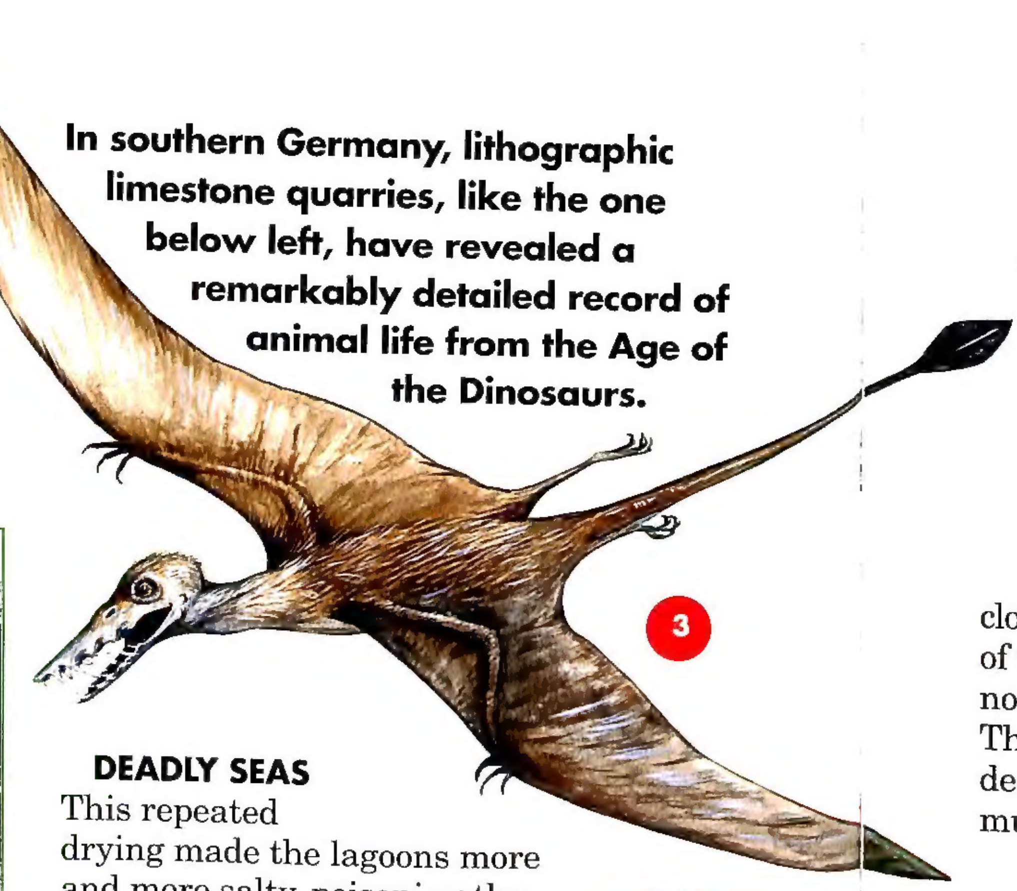
Lithographic limestone was formed in Late Jurassic times, about 150 million years ago. At that time, Europe was covered with a shallow sea. Animals such as sponges and corals grew there. When they died, they left behind their chalky skeletons, which built up into rocky barriers called reefs.

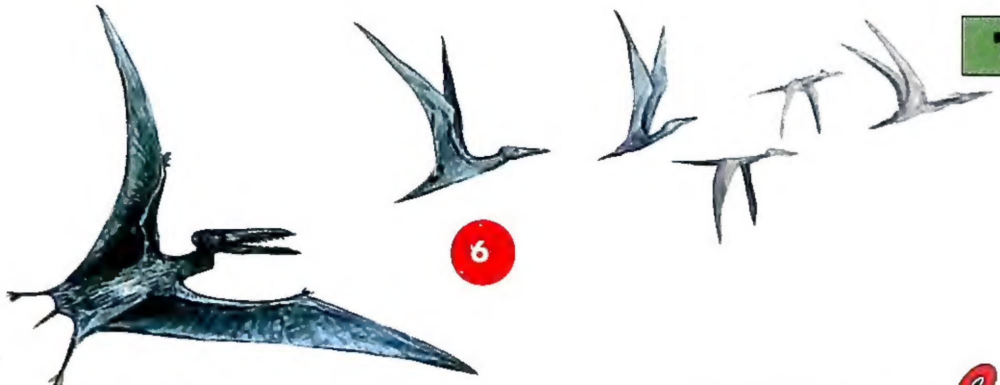
LAGOON LIFE

These reefs cut off the shallow waters from the main sea, making them into sheltered lakes called lagoons. At first, the lagoons were a source of food for the animals in the area. But the climate was so warm that the shallow water in the lagoons kept drying up.

DEADLY SEAS

This repeated drying made the lagoons more and more salty, poisoning the waters for all living things. If a fish swam into these warm, salty waters from the open sea, it would die. Any ammonite that drifted in also perished and sank in the toxic waters. Crabs and lobsters that found themselves trapped there dropped dead in their tracks.





KEEP OUT!

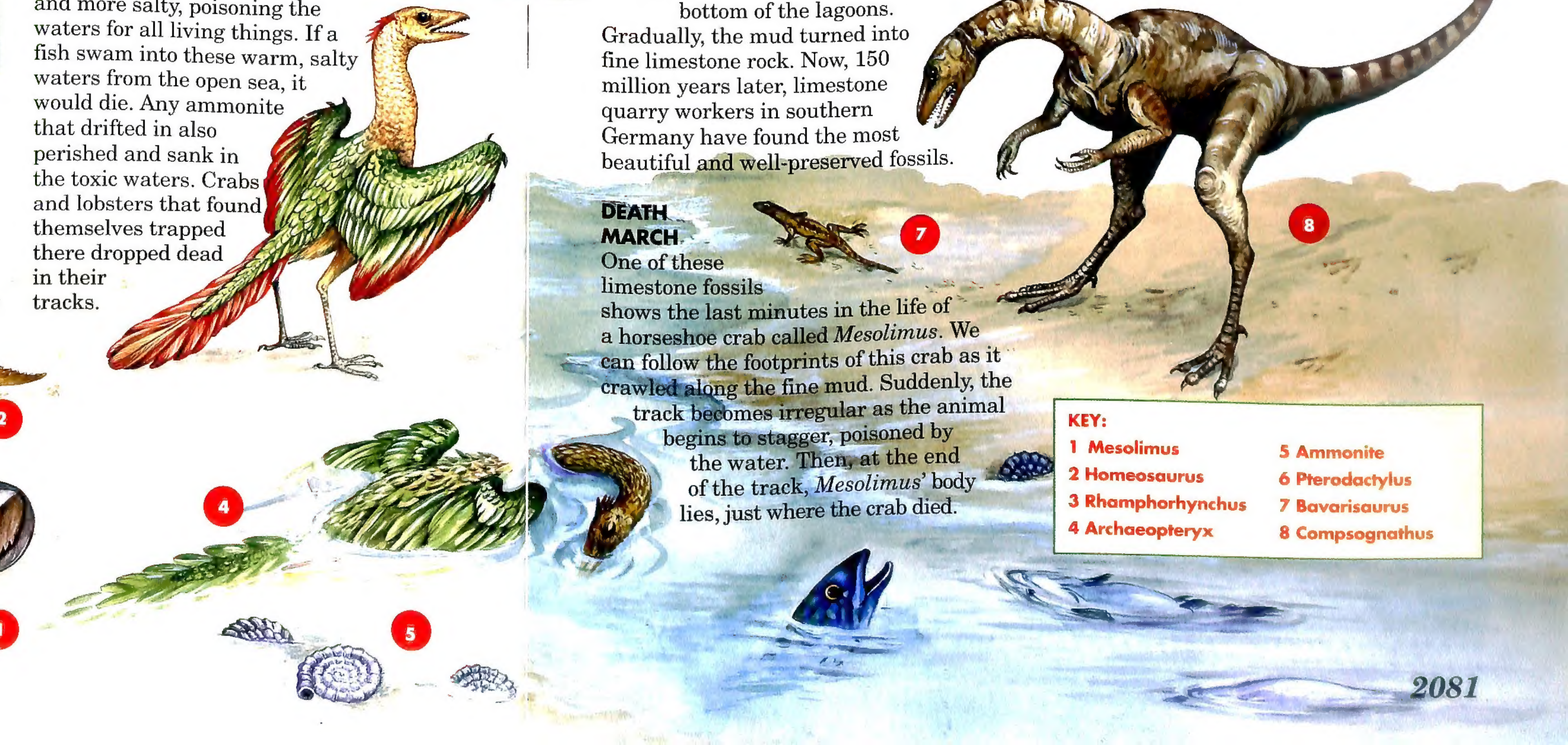
Many animals lived near the lagoons. Insects, pterosaurs and birds flew above the water, while little dinosaurs and lizards lived in the trees and on the nearby islands. Many ventured too close and these, too, ended up at the bottom of the lagoons. The water was so poisonous, no scavenging animals could live near it. There were no creatures to feed on all the dead bodies and no bacteria to rot the muscles and bones. So the bodies became buried in the fine mud at the bottom of the lagoons. Gradually, the mud turned into fine limestone rock. Now, 150 million years later, limestone quarry workers in southern Germany have found the most beautiful and well-preserved fossils.

DEATH MARCH

One of these limestone fossils shows the last minutes in the life of a horseshoe crab called *Mesolimus*. We can follow the footprints of this crab as it crawled along the fine mud. Suddenly, the track becomes irregular as the animal begins to stagger, poisoned by the water. Then, at the end of the track, *Mesolimus*' body lies, just where the crab died.

What is? LITHOGRAPHY

The word means 'writing on stone', and it is a printing process. A drawing is made on a perfectly smooth piece of fine limestone with a waxy or an oily pen. The surface is then wetted and covered with ink. The ink will not stick to the wet limestone, but it will stick to the oily pattern. Then, when paper is pressed against this surface, an image of the original drawing is made.



KEY:
1 Mesolimus
2 Homeosaurus
3 Rhamphorhynchus
4 Archaeopteryx
5 Ammonite
6 Pterodactylus
7 Bavarisaurus
8 Compsognathus

SHELL SHOCK

Lots of ammonites have been found in the lithographic limestones. Again, the impressions in the rock are a record of the exact moment that each ammonite died. In one fossil, a mark on the limestone shows where the ammonite hit the muddy bottom before falling over and being fossilized where it lay.

FOSSIL TENTACLES

Many belemnites – torpedo-shaped sea animals related to today's squids – have been found in these rocks. The fossils are preserved in life-like detail. You can even see the tiny hooks that they had on their tentacles to catch prey.

FISHY VICTIMS

Over 150 different species of fossil fishes have been found in the rocks. All of them sank gently to the bottom and were buried as the fine mud settled around them. No scavenging animals, or even bacteria, lived on the beds of the lagoons, so the bodies were complete when they became fossils.

IT'S A FACT

MAKING AN IMPRESSION

The Romans used German lithographic limestone for building, and so there have been quarries in the region for 2,000 years. In 1796, people began using the rock for printing plates. Its very fine grain, which holds an imprint for a long time, made it ideal for printing. The fine grain also means that a fossil embedded in it shows up clearly and is very well preserved.

REPTILE RELICS

Bigger creatures have also been preserved in the limestone. *Homeosaurus* was a 19cm-long sphenodont. Sphenodonts were a group of reptiles that was very common before and during the time of the dinosaurs. Today, there is only one species left, the tuatara, which lives on a few islands off New Zealand.

Compsognathus chases a lizard on one of the sandy islands by the limestone lagoons.

MYSTERIOUS DEATH

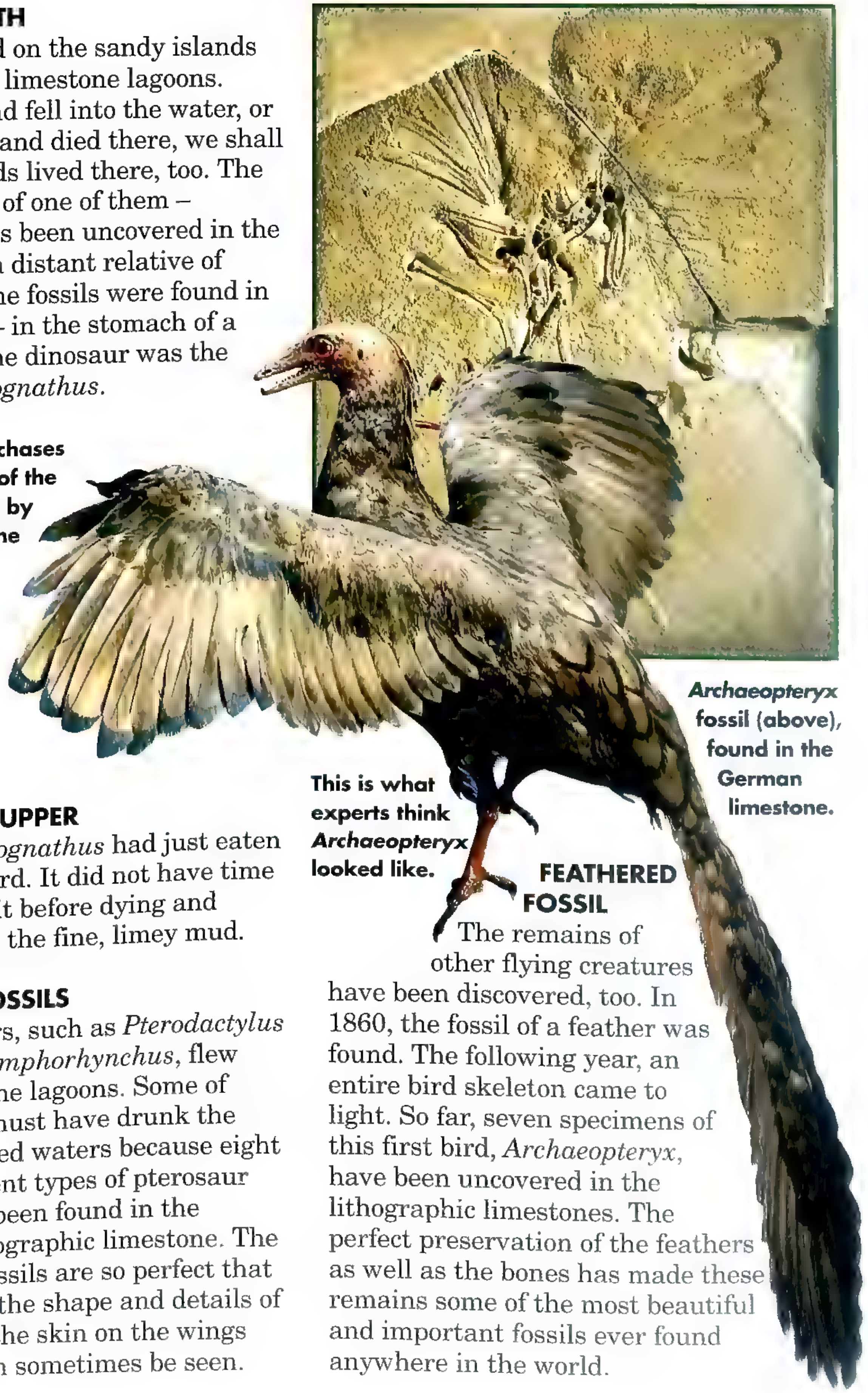
Homeosaurus lived on the sandy islands of the lithographic limestone lagoons. Whether it died and fell into the water, or fell into the water and died there, we shall never know. Lizards lived there, too. The fossilized skeleton of one of them – *Bavarisaurus* – has been uncovered in the limestone. It was a distant relative of today's geckoes. The fossils were found in an unusual place – in the stomach of a small dinosaur! The dinosaur was the 90cm-long *Compsognathus*.

LAST SUPPER

Compsognathus had just eaten the lizard. It did not have time to digest it before dying and falling into the fine, limey mud.

FLYING FOSSILS

Pterosaurs, such as *Pterodactylus* and *Rhamphorhynchus*, flew above the lagoons. Some of them must have drunk the poisoned waters because eight different types of pterosaur have been found in the lithographic limestone. The fossils are so perfect that the shape and details of the skin on the wings can sometimes be seen.



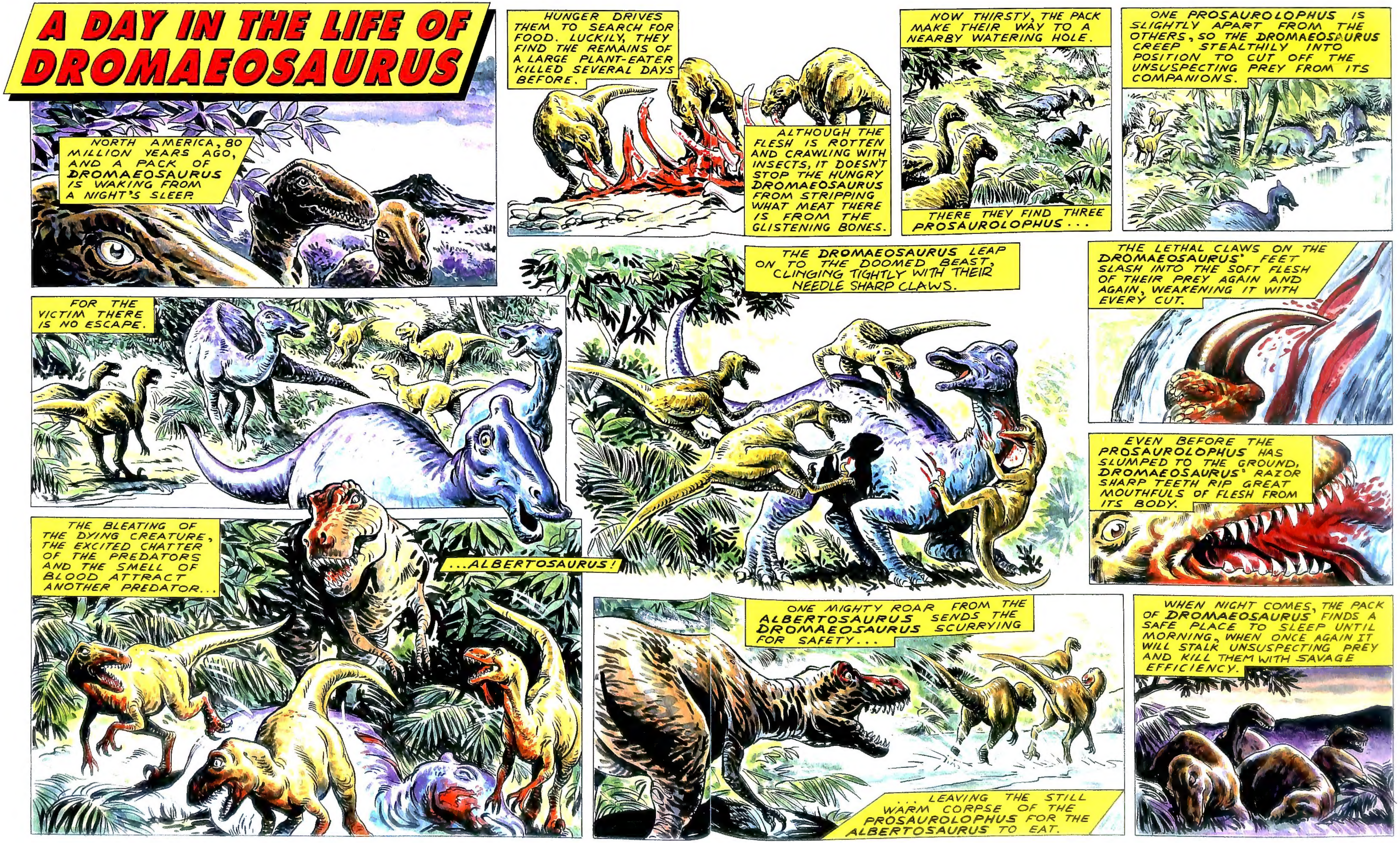
***Archaeopteryx* fossil (above), found in the German limestone.**

This is what experts think *Archaeopteryx* looked like.

FEATHERED FOSSIL

The remains of other flying creatures have been discovered, too. In 1860, the fossil of a feather was found. The following year, an entire bird skeleton came to light. So far, seven specimens of this first bird, *Archaeopteryx*, have been uncovered in the lithographic limestones. The perfect preservation of the feathers as well as the bones has made these remains some of the most beautiful and important fossils ever found anywhere in the world.

A DAY IN THE LIFE OF DROMAEOSAURUS


NORTH AMERICA, 80 MILLION YEARS AGO, AND A PACK OF DROMAEOSAURUS IS WAKING FROM A NIGHT'S SLEEP.
HUNGER DRIVES THEM TO SEARCH FOR FOOD. LUCKILY, THEY FIND THE REMAINS OF A LARGE PLANT-EATER KILLED SEVERAL DAYS BEFORE.
ALTHOUGH THE FLESH IS ROTTEN AND CRAWLING WITH INSECTS, IT DOESN'T STOP THE HUNGRY DROMAEOSAURUS FROM STRIPPING WHAT MEAT THERE IS FROM THE GLISTENING BONES.
NOW THIRSTY, THE PACK MAKE THEIR WAY TO A NEARBY WATERING HOLE.
THERE THEY FIND THREE PROSAUROLOPHUS...
ONE PROSAUROLOPHUS IS SLIGHTLY APART FROM THE OTHERS, SO THE DROMAEOSAURUS CREEP STEALTHILY INTO POSITION TO CUT OFF THE UNSUSPECTING PREY FROM ITS COMPANIONS.
FOR THE VICTIM THERE IS NO ESCAPE.
THE DROMAEOSAURUS LEAP ON TO THE DOOMED BEAST, CLINGING TIGHTLY WITH THEIR NEEDLE SHARP CLAWS.
THE LETHAL CLAWS ON THE DROMAEOSAURUS' FEET SLASH INTO THE SOFT FLESH OF THEIR PREY AGAIN AND AGAIN, WEAKENING IT WITH EVERY CUT.
EVEN BEFORE THE PROSAUROLOPHUS HAS SLUMPED TO THE GROUND, DROMAEOSAURUS' RAZOR SHARP TEETH RIP GREAT MOUTHFULS OF FLESH FROM ITS BODY.
THE BLEATING OF THE DYING CREATURE, THE EXCITED CHATTER OF THE PREDATORS AND THE SMELL OF BLOOD ATTRACT ANOTHER PREDATOR...
...ALBERTOSAURUS!
ONE MIGHTY ROAR FROM THE ALBERTOSAURUS SENDS THE DROMAEOSAURUS SCURRYING FOR SAFETY...
... LEAVING THE STILL WARM CORPSE OF THE PROSAUROLOPHUS FOR THE ALBERTOSAURUS TO EAT.
WHEN NIGHT COMES, THE PACK OF DROMAEOSAURUS FINDS A SAFE PLACE TO SLEEP UNTIL MORNING, WHEN ONCE AGAIN IT WILL STALK UNSUSPECTING PREY AND KILL THEM WITH SAVAGE EFFICIENCY.

Improve and test your knowledge with...

FACT FILE

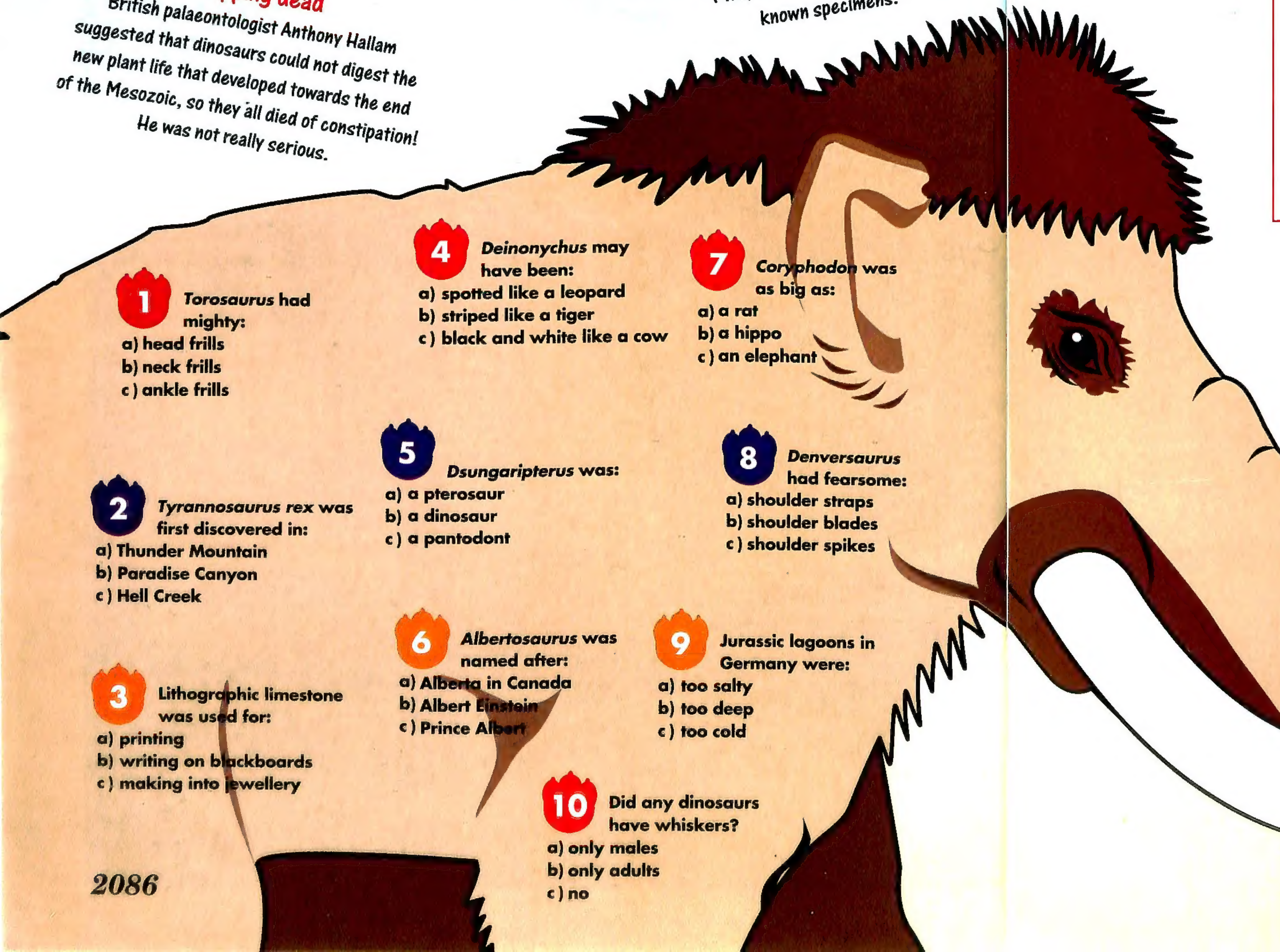
Follow the footprints on the mammoth's back and answer the questions posed!

Dropping dead

British palaeontologist Anthony Hallam suggested that dinosaurs could not digest the new plant life that developed towards the end of the Mesozoic, so they all died of constipation! He was not really serious.

Many old bones

Pteranodon remains are so common in the Late Cretaceous rocks of Kansas, USA, that when G.F. Eaton wrote the most important paper on them in 1910, there were already 465 known specimens.



1 *Torosaurus* had mighty:
a) head frills
b) neck frills
c) ankle frills

2 *Tyrannosaurus rex* was first discovered in:
a) Thunder Mountain
b) Paradise Canyon
c) Hell Creek

3 Lithographic limestone was used for:
a) printing
b) writing on blackboards
c) making into jewellery

4 *Deinonychus* may have been:
a) spotted like a leopard
b) striped like a tiger
c) black and white like a cow

5 *Dsungaripterus* was:
a) a pterosaur
b) a dinosaur
c) a pantodont

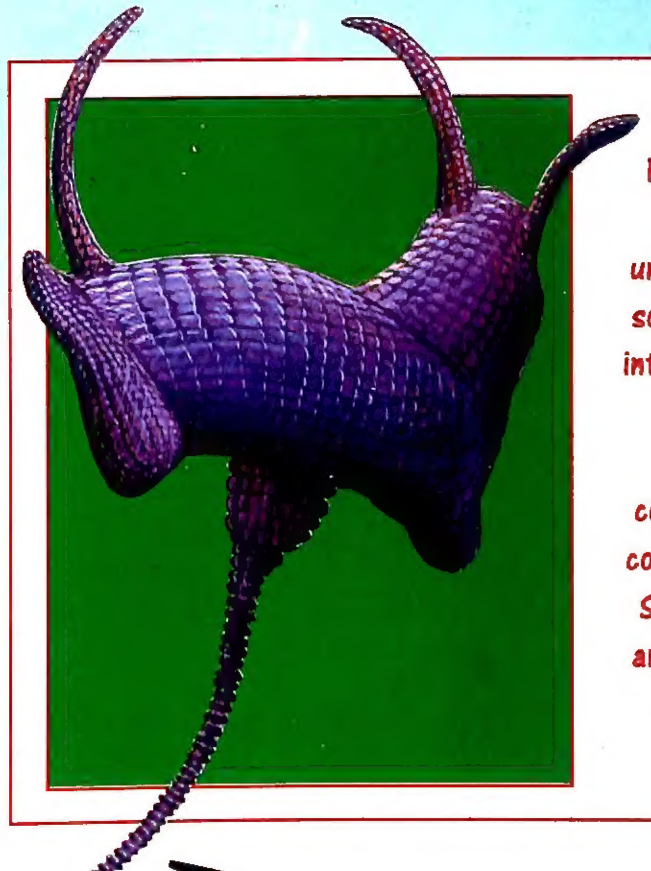
6 *Albertosaurus* was named after:
a) Alberta in Canada
b) Albert Einstein
c) Prince Albert

7 *Coryphodon* was as big as:
a) a rat
b) a hippo
c) an elephant

8 *Denversaurus* had fearsome:
a) shoulder straps
b) shoulder blades
c) shoulder spikes

9 Jurassic lagoons in Germany were:
a) too salty
b) too deep
c) too cold

10 Did any dinosaurs have whiskers?
a) only males
b) only adults
c) no



A hard case

Between 700 and 530 million years ago, life in the seas underwent a great change. Some soft-bodied creatures developed into animals with hard shells. This odd, fork-shaped animal, Cothurnocystis elizae, was covered in hard, bony plates and could fit in the palm of your hand. Some scientists believe that its ancestors were the ancestors of all animals with backbones, including human beings.

Cold turkey?

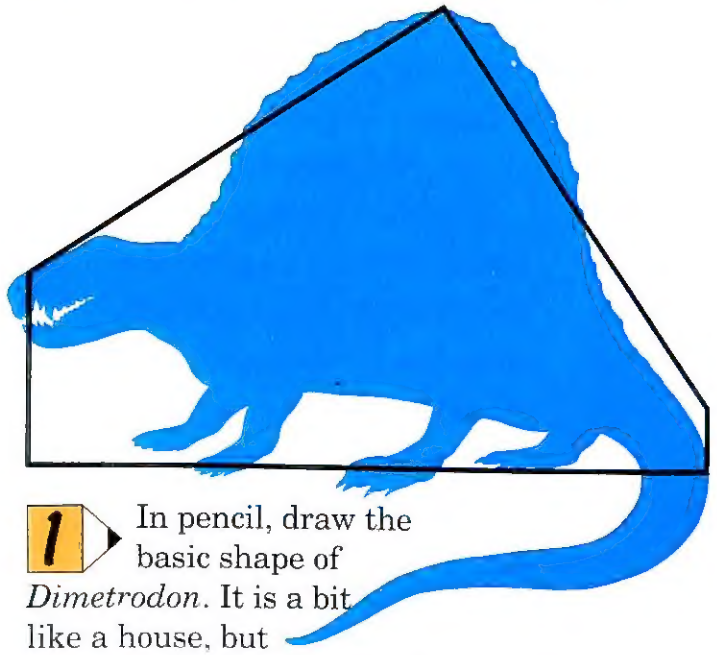
Growth lines in the bones of Mesozoic birds were more like those of crocodiles than those of today's birds. This suggests that the earliest birds may have been cold-blooded.

Staying alive

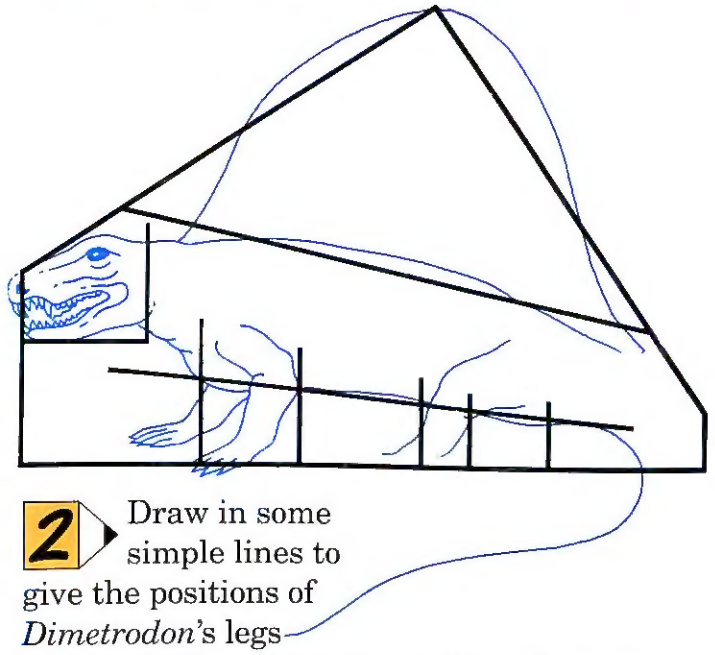
Dravidosaurus is a small stegosaur from India. It is from the Late Cretaceous – long after stegosaurs died out elsewhere. India was an island at the time, and it may be that it was a kind of lost world, preserving animals that had become extinct everywhere else.

Answers to the questions on inside back cover

DIMETRODON



1 In pencil, draw the basic shape of *Dimetrodon*. It is a bit like a house, but with the roof sloping further down on one side.

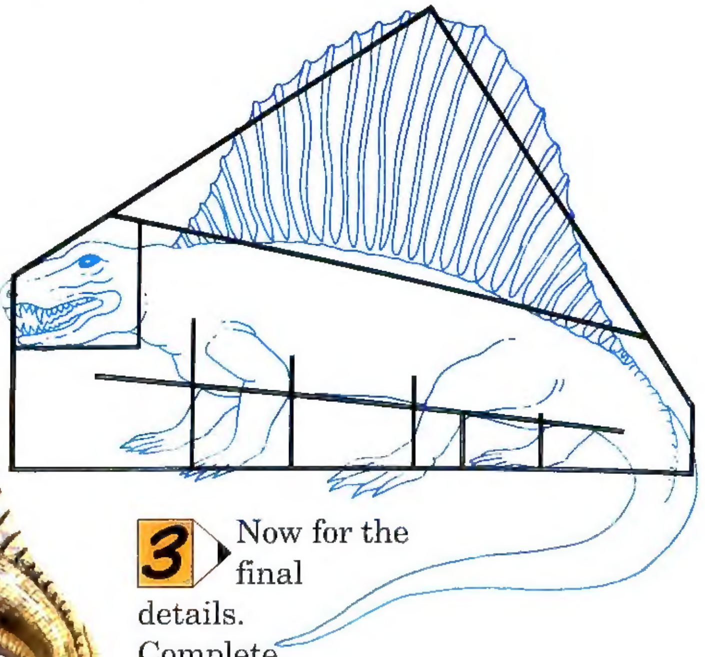


2 Draw in some simple lines to give the positions of *Dimetrodon*'s legs and head. Next, draw the outline, the face and teeth, and the basic shape of its sail. Also draw a curving line to show the position of its tail.

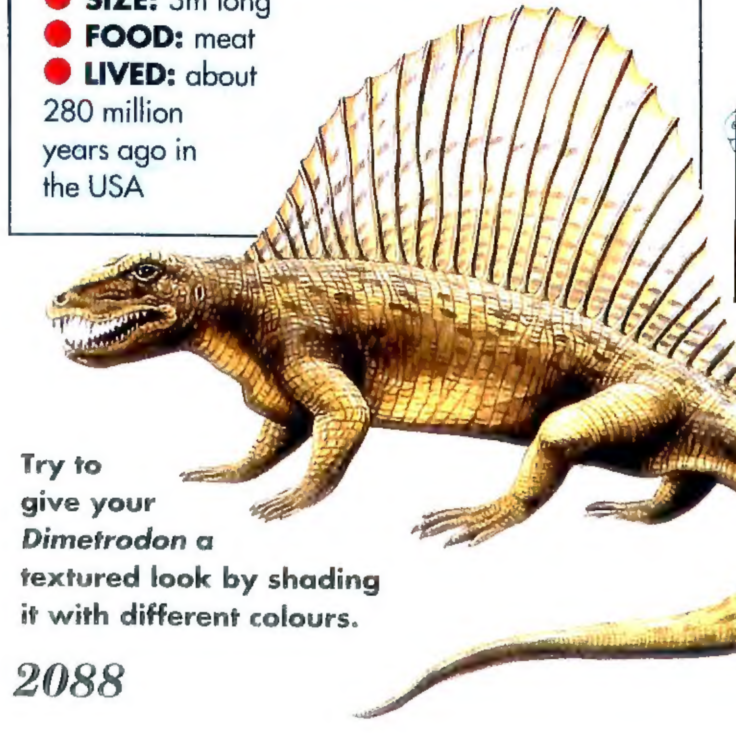
Fact box

Dimetrodon was a sail-shaped reptile.

- **NAME:** *Dimetrodon* (die-met-ro-don) means 'two long teeth'
- **GROUP:** mammal-like reptile
- **SIZE:** 3m long
- **FOOD:** meat
- **LIVED:** about 280 million years ago in the USA



3 Now for the final details. Complete the sail, showing its ragged outline and the spines supporting it. Finish drawing the tail and the feet.

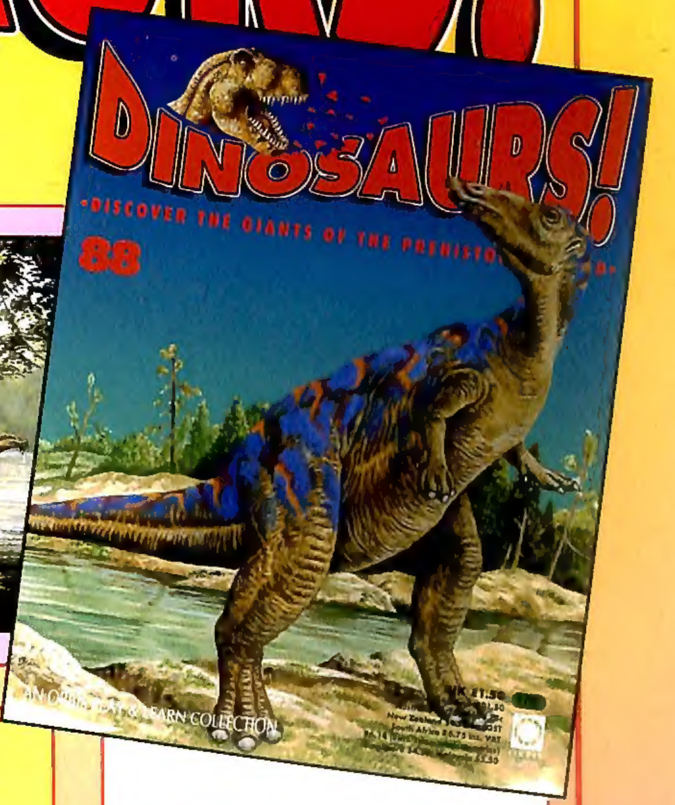


Try to give your *Dimetrodon* a textured look by shading it with different colours.

COMING IN PART 88 OF

DINOSAURS!

Go pond-dipping in the Age of the Dinosaurs in PREHISTORIC WORLD. Learn about fossil treasures in TIME DETECTIVE.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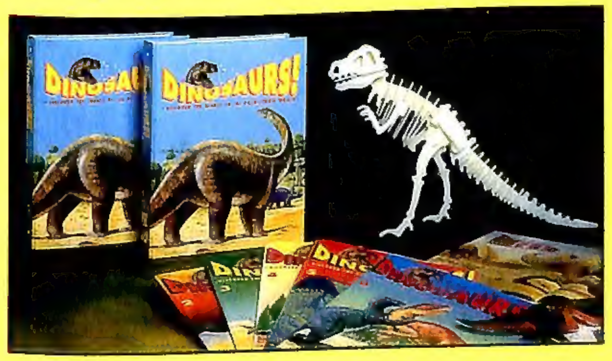

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PLUS

Three more fascinating creatures in IDENTIKIT and HISTORY IN PICTURES 3-D GALLERY GIANTS OF THE PAST

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ANSWERS TO FACT FILE QUESTIONS: 1.a 2.c 3.a 4.b 5.a 6.a 7.b 8.c 9.a 10.c

Dr David Norman of Cambridge University answers your dinosaur questions

ASK THE EXPERT

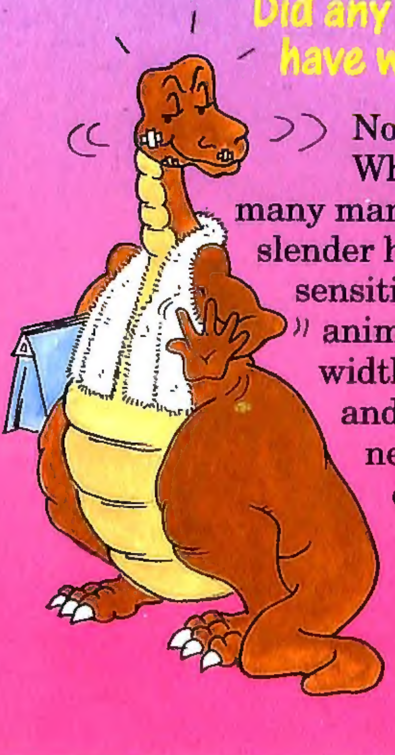
Were there any animals that meat-eating dinosaurs would not eat?

Yes is probably the answer. We cannot know for sure because it is impossible to identify all the defence mechanisms some creatures may have had just from their fossils. For instance, it would not be possible to tell from fossil bones that the skunk is avoided by all meat-eaters today. The scent gland that produces its vile smell would not be preserved if it was fossilized.

Which was the biggest muscle in the dinosaur's body?

The largest muscles in any dinosaur were the pair which ran alongside the tail and on to the back of each thigh. These huge muscles (caudifemoral is their technical name) were the ones responsible for pulling the hind legs backwards, and so making the dinosaur move forwards on land. They were the main walking muscles, and had to be the biggest and most powerful of all.

Did any dinosaurs have whiskers?



No, I don't think so. Whiskers are common in many mammals. These long, slender hairs are very sensitive, and are used by animals to work out the width of holes and gaps, and to sense anything near the face. Dinosaurs did not have hair anywhere on their skin, just scales.

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